

I/WE CLAIM:

1 1. Apparatus comprising:
2 a valve for controlling a flow of product;
3 a first sterile region surrounding a region where
4 the product exits the valve;
5 a second sterile region positioned proximate said
6 first sterile region;
7 a valve activation mechanism for controlling the
8 opening or closing of the valve by extending a portion of
9 the valve from the second sterile region into the first
10 sterile region and by retracting the portion of the valve
11 from the first sterile region back into the second sterile
12 region.

1 2. The apparatus of claim 1, further including:
2 a tank for containing a pressurized supply of the
3 product; and
4 a measuring device connected to the tank for
5 measuring an amount of the product flowing from the tank to
6 the valve.

1 3. Apparatus comprising:

2 a tank for containing a supply of a pressurized
3 product;

4 a measuring device connected to the tank for measuring
5 an amount of the product flowing from the tank to a
6 container;

7 a filling nozzle connected to the measuring device for
8 directing product flow into the container;

9 a valve located within the filling nozzle for
10 controlling the flow of product;

11 a first sterile region surrounding a region where the
12 product exits the valve;

13 a valve stem attached to the valve for controlling the
14 opening or closing of the valve;

15 a sterilization chamber surrounding a first portion of
16 the valve stem; and

17 a valve activation mechanism for controlling the
18 opening or closing of the valve by extending the first
19 portion of the valve stem from the sterilization chamber
20 into the first sterile region and by retracting the first
21 portion of the valve stem from the first sterile region back

22 into the sterilization chamber.

1 4. The apparatus of claim 3, wherein the container is a
2 bottle.

1 5. The apparatus of claim 3, wherein the tank is
2 pressurized with sterile air.

1 6. The apparatus of claim 3, further including a level
2 measuring device for measuring the level of the product in
3 the tank.

1 7. The apparatus of claim 6, wherein the measuring device
2 is a volume flow meter.

1 8. The apparatus of claim 7, wherein the volume flow meter
2 is a magnetic flow meter.

1 9. The apparatus of claim 6, wherein the measuring device
2 is a mass flow meter.

1 10. The apparatus of claim 3, wherein the valve activation
2 mechanism includes an air cylinder.

1 11. The apparatus of claim 3, wherein the sterilization
2 chamber includes a sterilant flowing through the
3 sterilization chamber to provide sterilization and cleaning
4 of the first portion of the valve stem.

1 12. The apparatus of claim 11, wherein the sterilant is
2 steam.

1 13. The apparatus of claim 11, wherein the sterilant is
2 hydrogen peroxide.

1 14. The apparatus of claim 3, further including a removable
2 device for blocking off an exit of the valve to allow a
3 build-up of steam pressure inside the tank during an initial
4 apparatus sterilization.

1 15. The apparatus of claim 3, wherein the container is
2 filled to a first level with the product exiting from the
3 filling nozzle and wherein the container is filled to a
4 second level with product exiting from a second filling
5 nozzle.

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1 16. A method comprising the steps of:
2 *Sub*
2 *a2* controlling a flow of product using a valve;
3 surrounding a region where the product exits the
4 valve with a sterile region;
5 providing a second sterile region positioned
6 proximate said first sterile region; and
7 controlling the opening or closing of the valve by
8 extending a portion of the valve from the second sterile
9 region into the first sterile region and by retracting the
10 portion of the valve from the first sterile region back into
11 the second sterile region.

1 17. The method of claim 16, further including the step of
2 providing a tank for containing a supply of pressurized
3 product flowing to the valve.

1 18. The method of claim 17, further including the step of
2 providing a measuring device for measuring the amount of
3 pressurized product flowing from the tank to the valve.

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1 18. The method of claim 16, further including the step of
2 providing a second apparatus wherein the container is filled
3 to a first level with the product exiting from the first
4 apparatus, and the container is filled to a second level
5 with the product exiting from the second apparatus.

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1 20. The method of claim 18 further including the steps of:
2 exposing the valve, an interior surface of the
3 tank, and an interior surface of the measuring device with
4 steam;
5 covering an exit of the valve; and
6 allowing a build-up of steam pressure inside the
7 tank to above a temperature of about 250°F, a steam pressure
8 of about 50 psig, for about 30 minutes.

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1 21. The method of claim ~~19~~ further including the steps of:
2 uncovering the exit of the valve; and
3 providing sterile air to reduce the temperature of the
4 valve, the interior surface of the tank, and the interior
5 surface of the measuring device to the temperature of the
6 product.

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